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1979 ANNUAL REPORT

To the Secretary of Agriculture



Joint Council
on Food and
Agricultural Sciences

March, 1980

1979 ANNUAL REPORT

TO THE SECRETARY

OF AGRICULTURE

A Report of the Joint Council
on Food and Agricultural Sciences

March 1980

JOINT COUNCIL ON FOOD AND AGRICULTURAL SCIENCES

Secretariat:
Science and Education Administration
U.S. Department of Agriculture
Washington, D.C. 20250

Honorable Bob Bergland
Secretary of Agriculture
Washington, D.C. 20250

Dear Mr. Secretary:

We are pleased to submit the annual report of the Joint Council on Food and Agricultural Sciences.

The Joint Council was established by P.L. 95-113. Its membership includes representatives from institutions having research, extension and teaching responsibilities in the food and agricultural sciences, from the Office of Science and Technology Policy, and from the public. The institutions represented include public and private universities and colleges, private organizations, and USDA agencies.

In its second year of operation, the Joint Council concentrated its efforts on improving planning and coordination by establishing an organizational structure of Regional Councils and planning committees and by stepping up the interchange of information among research, extension and teaching partners in both public and private spheres.

The Council commissioned studies to evaluate agricultural research facilities and placed immediate emphasis on improving coordination in human nutrition, integrated pest management and small farms problems. It also sponsored a 5-year projection of areas of emphasis.

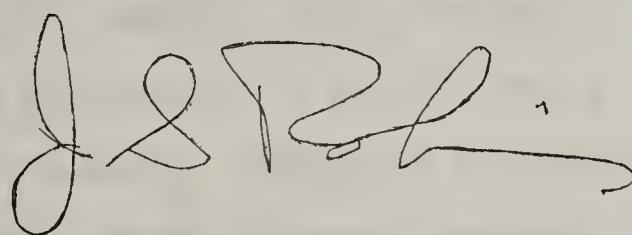
Special emphasis in 1980 will be given to planning and coordinating research, extension and teaching as they relate to energy development and use.

We appreciate this opportunity to brief you on Council activities.

Sincerely,



ANSON R. BERTRAND
Cochairman



J. S. ROBINS
Cochairman

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EXECUTIVE SUMMARY

The Joint Council on Food and Agricultural Sciences was established under authorization of Section 1407 of Title XIV of the Food and Agriculture Act of 1977.

Membership includes representatives of U.S. Department of Agriculture (USDA) agencies, the Office of Science and Technology Policy, land-grant colleges and universities, State agricultural experiment stations, State co-operative extension services, other colleges and universities, foundations, private industry, producers, and the public.

In its second year of operation the Council took steps to improve its planning and coordination functions -- it established an organizational structure of Regional Councils and planning committees -- it initiated in-depth evaluations to better identify goals and criteria for determining priorities and to define budget roles and responsibilities. As part of its ongoing role the Council also serves as a forum for interchange of information among the partners about present and future programs within the food and agricultural sciences.

This report of the Council contains: (1) accomplishments in fostering coordination during the past year; (2) Joint Council interaction with the Users

Advisory Board; and (3) a brief summary of selected accomplishments of the agencies within USDA which have membership on the Joint Council.

In 1979 the Joint Council placed major emphasis on improving coordination in human nutrition, integrated pest management, and small farms problems and programs. It appointed an Interim National Research Planning Committee to continue the 5-year research planning cycle while the permanent planning structure is being established. The Council also took action to provide for broad involvement of public and private interests in development of plans for Renewable Resources Extension programs.

The Council, through subcommittees, prepared a report on the President's FY 1980 budget and commissioned two studies to evaluate agricultural research facilities and make recommendations for the future.

Looking toward future needs, the Joint Council initiated efforts to develop a 5-Year Projection for the Food and Agricultural Sciences, which would serve as an umbrella for activities in research, extension, and teaching.

In 1980, the Council will be continuing the special emphasis on improving coordination in programs initiated in 1979 and, in addition, will place special emphasis on programs in energy development and use.

INTRODUCTION

The process of change and innovation which has created the present day U.S. food and agriculture system has been heavily dependent upon science and education. By helping to expand the effective capacity of both the human and natural resource base of this country, science and education in the food and agriculture system and in rural America have contributed to a level of national abundance unequaled in the history of human kind.

A system of publicly funded research, extension, and higher education in the food and agricultural sciences has been a contributor to this process. The roots of this system extend into fundamental physical, biological, and social sciences. Its branches interface directly with the people of rural America; with the owners and users of natural resources; with producers, marketers, and consumers of food, natural fiber, and wood products; and with other units of government which perform service or regulatory functions having to do with food, agriculture, or natural resources. The system generally provides input to and complements the wide array of research, product development, and information disseminating activities carried out by the private sector.

Various studies have shown a strong positive relationship between the level of education in the agricultural sector and the productivity of that sector.

Many other studies have documented the large payoff to society for its investment in agricultural research and education. A recent evaluation of 32 studies which quantified the contribution of research to agricultural productivity showed that 83% of the estimates in these studies indicated annual rates of return above 25% and over one-third estimated rates of returns of more than 50% per year. The studies which were evaluated covered many commodities and commodity groups and focused on the U.S. as well as other parts of the world.

Historically, a major strength of the system has been its ability to direct efforts toward high priority problems of agriculture in a coordinated fashion and to integrate the contributions of various disciplines in research, extension, and teaching.

As the system has adapted to the need for more sophisticated research and outreach programs, the coordination and integration functions naturally became more complex and required more careful attention. Institutions and mechanisms that had served the system well in the past were not always fully adequate to serve modern agriculture, and to meet the expectations of an accountability conscious public.

In response to these developments the Congress in one of the provisions of the Food and Agriculture Act of 1977 directed that a Joint Council on Food and Agricultural Sciences be established.

Interrelationships among the basic industries of agriculture and forestry and the other sectors of the domestic economy have grown in both number and complexity over the years. Events in the past decade also demonstrate the degree to which U.S. producers and consumers of agricultural and forest products are affected by changing world supply and demand conditions. Chances are greater than ever before that developments in the nonagricultural sectors of the U.S. economy or in the international arena will affect U.S. producers and consumers of agricultural and forest products.

Continued inflation, higher unemployment, and slower economic growth are the central themes of most economic forecasts for the U.S. economy in the early 1980's.

Economic growth rates are expected to remain low by historical standards for the next 2 to 3 years throughout much of the world. Considerable concern is currently being expressed about apparent declines in rates of productivity increase in both the industrial and agricultural sectors. Although there is lack of consensus about the cause and the extent of the alleged "leveling off" especially in

agriculture, there is general consensus of concern about declining rates of increase of crop yields in the U.S. Along with the need for increased total agricultural production is the need to reduce wide variations in output through time. The vulnerability of agricultural production to the vagaries of weather or other disruptive influences has been demonstrated over and over through the course of history.

Concerns about insufficient productivity growth are coupled with current and continuing uncertainties about commodity price levels, costs of production, availability or energy supplies, impact of environmental regulations and climatic change.

The U.S. will continue to need greater output of food, fiber, and wood products in the future to meet increasing domestic demands and to provide larger quantities for export. At the same time, the resources used in producing these products will increasingly be needed for other purposes.

This, then, is the framework in which decisions regarding the food and agricultural science system must be made.

PURPOSE, MEMBERSHIP, OBJECTIVES

The Joint Council, established in 1978 by the Secretary of Agriculture at the direction of Congress, is composed of representatives of agencies in the Department of Agriculture with significant research, teaching, and extension responsibilities, the Office of Science and Technology Policy, the land-grant colleges and universities, the State agricultural experiment stations, the State cooperative extension services, other public and private institutions and producers.

The primary purpose of the Joint Council is to foster planning and coordination of agricultural research, extension, and teaching activities among all participants in the system.

In addition, it provides a forum for the interchange of information among organizations represented on the Joint Council; analyzes and evaluates the economic, environmental, and social impacts of agricultural research, extension, and teaching programs; derives high priority agricultural research areas; and reviews the effectiveness of the system. The Council is also charged with developing and reviewing the effectiveness of guidelines for use in making competitive grants.^{1/}

The Joint Council is jointly chaired by Anson R. Bertrand, Director of Science and Education, USDA, and John S. Robins, Dean, College of Agriculture, Washington State University.

The Council met once each quarter during the past year and the July meeting was a combined meeting with the National Agricultural Research and Extension Users Advisory Board.

1/ A detailed list of the current Joint Council members and their affiliations appears in Appendix A.



ACCOMPLISHMENTS OF THE JOINT COUNCIL IN FOSTERING PLANNING AND COORDINATION

This section describes briefly those accomplishments of the Joint Council which strengthen planning and coordination in the food and agricultural sciences. The following accomplishments were made in 1979:

- A regional and national planning structure designed to improve planning and coordination of research, extension, and higher education, was developed and is beginning to function.
- An interim research planning committee was established to assure the continued coordination of national and regional research planning while a new structure for overall planning is being developed and implemented.
- Special efforts were given to determining the human nutrition needs and to improving coordination of activities to meet those needs.
- Integrated Pest Management

and the program needs of small farms were also subjects of special studies and coordination efforts.

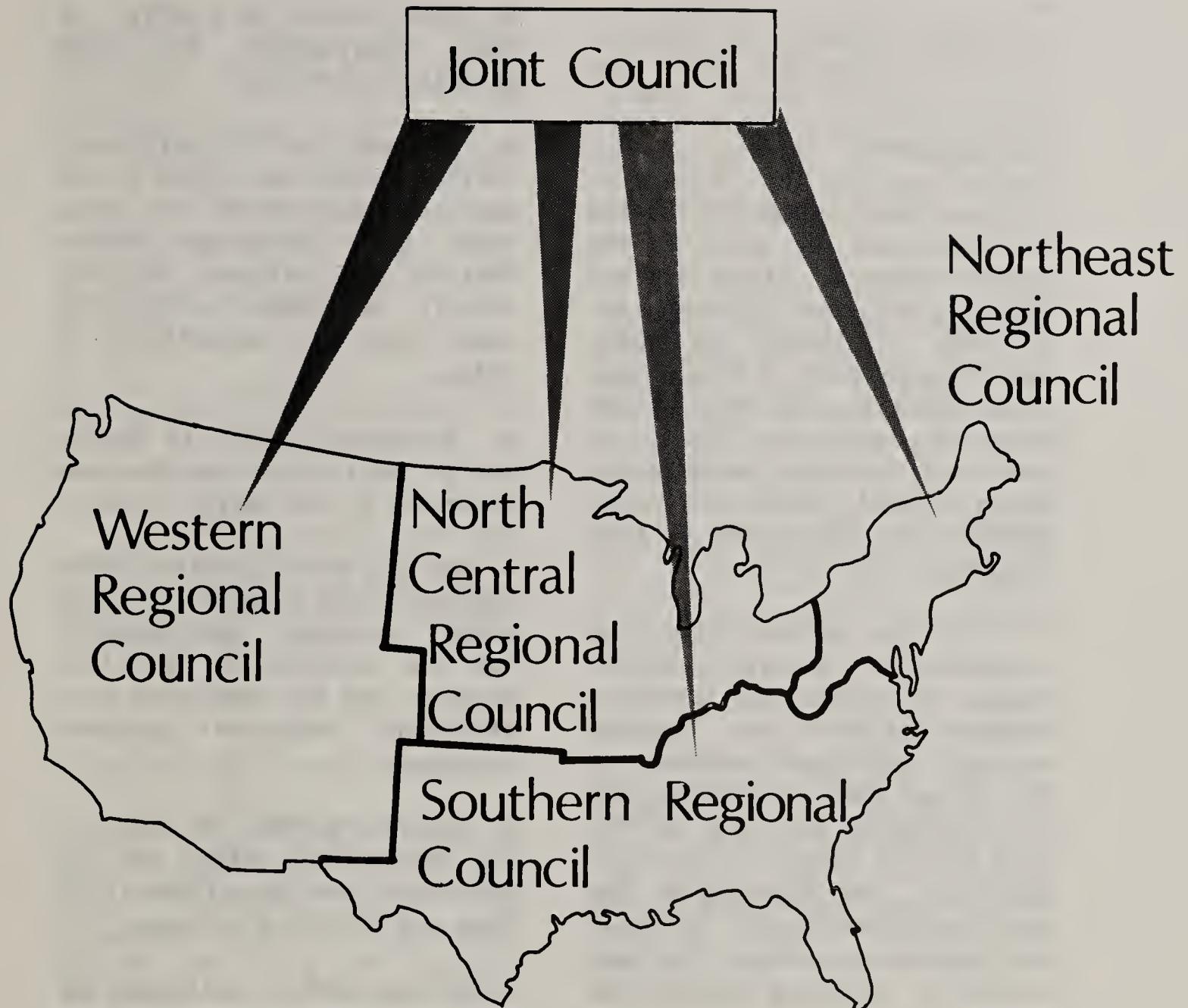
- The Council sponsored the Renewable Resource Extension Act (RREA) planning efforts. It also supported a higher education manpower study and a study of facilities for food and agricultural research.

Regional Planning and Coordination

In its first year of deliberations, the Joint Council concluded that a regional and national planning and coordination structure was needed to provide for full participation in the process and to facilitate the flow of information throughout the system. The organizational structure eventually selected was designed to address both regional and national issues; those issues unique to each of the three functions (research, extension, and higher education); and those issues cutting across functions and regions (Figure 1 shows this organizational structure).

The key element in the organizational structure is the Regional Councils. Each of the Regional Councils have planning and coordination committees for research, extension, and teaching.

One or more members of a steering committee will meet in the near future with the newly appointed members of the permanent Regional Councils to help them get established and become an important adjunct to the Joint Council.



Joint Council on Food and Agricultural Sciences
Organizational Structure for Planning and
Coordination

Human Nutrition

The Joint Council studied and evaluated the scope of the current research, extension, and teaching programs in human nutrition. Although the human nutrition program is broad, many areas which receive insufficient emphasis were identified. A need for improved coordination among Federal, State and other partners in the system is also apparent.

The study helped fulfill the congressional mandate to develop new initiatives for improving human nutrition and health-related nutrition problems in the United States; assisted USDA in clarifying its role as the lead Federal agency in research, extension, and teaching in the food and agricultural sciences; and served as a basis for more effective planning within the system.

A total USDA-related research effort in human nutrition of approximately \$35 million in 1978 was identified. Although a wide range of investigations is apparent, few if any areas of research are receiving attention commensurate with current public needs. Some specific areas in which greater effort is needed are:

- Basic research on the nutrient requirements of most age and sex groups. Practically

no quantitative data exist on the requirements of some essential nutrients.

- Although in 1978 relatively little emphasis was given to the nutrient requirements of pregnant and lactating women, infants and children, and the elderly, substantial efforts in these areas were established in 1979.
- Increased effort to define energy requirements and the consequences of low energy intakes.
- New and more effective methodologies are required in many areas including methodologies for the analysis of nutrition behavior and for developing more effective nutrition guidance programs.
- Improved methods for evaluating nutritional status and for evaluating the effectiveness of food and nutrition programs.
- Further work to delineate the complex relationships between environmental factors, including diet, and health.
- More adequate information systems on manpower needs in nutrition or the training programs which develop nutritionists.

Some of the recommendations based upon this study are:

- The development of an adequate data base and system which will permit coordinated planning in nutrition research, extension, and education.

- Increased attention given to long-range planning in human nutrition programs with special emphasis on strengthening university capacity for research and training in human nutrition
- The development of more effective strategies for timely transfer of scientific and technical information in human nutrition.
- The development of an effective system for the assessment of higher education programs in human nutrition.

A final report is now complete and the Council will continue emphasis on the coordination of activities in human nutrition in 1980.

Integrated Pest Management

Pest problems are increasing in the United States. At the same time, there is rising public concern about the potential hazards to human health from long-term exposure to pesticide residues in foods and the harmful impacts of these residues on endangered and beneficial insect species. There is also growing recognition of the value of Integrated Pest Management (IPM) as a system of crop protection that relies less on traditional chemical agents to reduce or eliminate pest problems.2/

Improved coordination of IPM programs in research, extension, and higher education sectors is needed. This improved coordination requires the development of appropriate implementation, management, and delivery systems at Federal, State, and regional levels.

The Joint Council placed special emphasis on Integrated Pest Management during 1979. A symposium on planning and coordination of Integrated Pest Management Programs was held, during which the Council reviewed related areas of crop production, pest problems, climate and pest management, tillage practices, and use of agrochemicals to control pest damage on crops.

The Joint Council recommended that the Secretary request the Council on Environmental Quality (CEQ) to have the Federal working group on IPM reactivated as soon as possible. The Joint Council is working with regional IPM committees in planning and implementing regional and national symposia cooperatively.

Continuing research is needed to develop improved Integrated Pest Management programs. This needed research includes: in weed science--basic weed biology, herbicides, and non-chemical control methods; in plant pathology--development of

2/ See "Integrated Pest Management: A Program of Research for the State Agricultural Experiment Stations and the Colleges of 1890, conducted by the Intersociety Consortium for Plant Protection for Experiment Station Committee on Organization and Policy (ESCOPE), September 1979.

disease-resistant varieties, gene deployment, and pathogen variability; in entomology--the development of insect control tactics in IPM programs such as host plant resistance, and biological, chemical, and cultural control; in nematology--understanding the biology of and interactions among nematodes, and developing new and improved management strategy systems.

Impetus must be given to higher education if the rudimentary IPM programs are to serve a useful purpose. Forty-two colleges and universities have initiated programs at the baccalaureate level and 11 at the masters level. New interdisciplinary courses are needed, pest clinics must be established, and professionals (Ph.D's) with an interdisciplinary orientation are needed for teaching and research. ADP data bases are needed on a State and regional basis to support teaching, as well as research and extension. As new personnel emerge from the educational programs, they must be multidisciplinary in scope, diagnostic in their approach to problems, and understand the economic as well as environmental implications.

Pilot and development work on the Extension IPM program has demonstrated that a significant potential exists utilizing presently known technology to reduce pesticide use while sustaining optimum production. IPM programs are currently being carried out on 17 million acres involving 45 agricultural commodities. With limited additional professional resources, this

program can be rapidly expanded in the crops area. Additional pilot and development work is needed in livestock production and home gardens, in special regional crop ecosystem projects, and in small farm specialty crops.

Small Farms

Small farm programs in the research, extension, and higher education sectors were also the subject of special study in 1979. The results of this study present a concise and straightforward description of the current status of small farm research and education; a rationale for continued assistance to small farm operators which broadens the view about small farms; and specific recommendations for strengthened coordination efforts and increased funding for programs to solve problems unique to small farms.

The rationale for continued small farms assistance suggests that: (a) all farmers, regardless of farm size, should be in a position to benefit from public programs, including agricultural science and education programs; (b) equity considerations require that attention be given to those whose needs are greatest, and thus, that effort be expended to assist low income small-scale farmers to raise their income, from either farm or nonfarm sources; (c) the U.S. agricultural system that provides for small farms preserves the opportunity for persons to choose small-scale farming or to combine it with

off-farm employment as a life style; and (d) assistance to small farmers will promote better management and more effective use of a significant part of the Nation's natural resources. These are strong and compelling reasons for supporting programs to assist small-scale farmers. Efforts to assist small farms will have only nominal impact on the overall supply of food or the concentration of farms producing most of this Nation's food and fiber; hence, food supply and/or changes in the concentration of production should not be used as a justification for small farm programs.

There are currently \$5.1 million devoted specifically to small farm research and \$52.0 million in extension--including \$2.0 million of Federal and \$5.0 million of non-Federal funds for the special pilot projects providing intensive one-to-one assistance to small-scale farmers. After a careful review of ongoing activities and of what most needs to be done in the near term, the Joint Council endorses the report's recommendations for a modest Federal increase of \$14.5 million; \$9.5 million for research and \$5.0 million for extension.

There is presently a major need to study the characteristics and the educational strategies to address the needs of the small farm operators most in need of additional assistance, and there is much to be done in developing and adapting technologies for small farms.

The Council will encourage

inclusion of a small farms component in its regional and national planning and coordinating structure for research, extension, and higher education, and will be encouraging research and extension managers to look for opportunities to redirect resources to small farm activities. However, agricultural research and extension have generally been underfunded in recent years relative to other uses of public funds, given the rates of return that have been estimated for agricultural research. Therefore, the Council concludes that new initiatives on small farms should be funded primarily with increased resources.

Interim Research Planning Committee

An Interim National Research Planning Committee (NRPC) was appointed in 1978 by the Joint Council on Food and Agricultural Sciences and instructed to continue the research planning efforts of the Regional and National Agricultural Research Planning System established in 1972 by the Agricultural Research Policy Advisory Committee (ARPAC).

The role and function of this Interim Committee is to continue procedures for operation of the Regional and National Planning System. The system is designed to monitor performance, review inputs; and evolve and recommend a national

research plan for each cycle of operation.

This interim committee continued the 5-year planning cycle in accordance with Section 1405 of the Food and Agricultural Act of 1977, and will remain in operation until the Joint Council establishes its permanent structure for coordinating national and regional planning for research, extension, and higher education.

The five-year planning projections for food and agricultural research are prepared by USDA and State administrators in the 56 State agricultural experiment stations, 16 land-grant institutions established in 1890 and Tuskegee Institute, 16 Schools of Forestry, and the 3 USDA agencies that conduct research. These projections provide an indicator of how scientific resources might be allocated in the USDA-State system under assumed levels of scientific and monetary resources.

Implementation of a renewable resource plan throughout the country will help the Nation address many of its unmet conservation and resource needs. For example, there is significant opportunity to increase red meat production on the Nation's rangelands. There are also significant opportunities to expand wildlife, outdoor recreation, and urban forestry education. Improved procedures for harvesting wood and using it for fuel will reduce energy loss and waste of renewable resources. Improved forest and range management practices can reduce conflicts between commodity and environmental groups. Improved forest management and wood utilization can expand timber supplies and help reduce inflationary pressures.

The Council, through its coordination activities in 1980, will continue support of the national effort to achieve a better balance in the development and utilization of renewable resources. The Council is further lending support to the efforts for State initiation of resource plans and coordination of State plans at regional workshops.

Development of a National Renewable Resources Extension Plan

The Joint Council, through its coordination efforts, took action to encourage and assure broad involvement of a wide range of public and private interests in the development of a Five-Year Plan for Renewable Resources Extension programs.

Joint Budget Efforts Between SEA, FS, and ESCS

The Joint Council has encouraged coordination activities among its members. This resulted in improved coordination of budget activities for 1981 between the Forest Service and SEA. This activity was a natural followup of the joint

planning efforts of USDA and the cooperating forestry schools in 1976-78 which resulted in a National and Regional Program of Research for Forest and Associated Rangelands. The Economics, Statistics, and Cooperatives Service (ESCS) and SEA took several steps to improve joint planning and coordination. ESCS detailed staff members to the Joint Planning and Evaluation unit of SEA to provide liaison. Task forces were established to identify high priority areas for joint research and the coordination of budget development.

Higher Education Manpower Study

The Joint Council has endorsed and supported the comprehensive manpower study of food and agriculture's higher education needs which is being conducted by SEA's Office of Higher Education. This project responds to the critical need for developing models which predict the occupational structure of the agribusiness sector of the Nation's economy and the extent to which higher education graduates have the specific types of skills required by the labor force in business and industry, government, and education.

The study identifies the supply and anticipated demand in the field of food and agriculture and related fields and thus will lend itself to improved educational planning. The study also provides a model for followup studies which will

provide consistent longer range data upon which to base predictions of supply and demand for specific educational needs.

Agricultural Research Facilities Study

The Joint Council, responding to the Secretary of Agriculture's request to assist in evaluating agricultural research facilities, commissioned two study groups.

One group, charged with evaluating policies and criteria for decisionmaking on agricultural research facilities submitted a report to the Secretary of Agriculture in July. This report recommended that: (1) research facility planning and budgeting should be an integral part of program planning in the agricultural research system; (2) each major program should be analyzed to determine whether it can most effectively be carried out through use of federally owned or leased facilities; (3) where facilities for joint Federal-State programs are not available or cannot otherwise be acquired, and where appropriate to the program plan, the Federal Government should assist in funding State-owned facilities; (4) Federal funding in support of State-owned facilities should take the form of a combination of formula funds to maintain an effective research base and specific funds for facilities to support high priority programs.

The second group was charged with obtaining data on the status and future needs for

agricultural research facilities in accordance with State, regional, and national priority programs. The group undertook a survey of the USDA agencies (the Forest Service and SEA-Agricultural Research) and the State institutions currently authorized to receive Federal funds for agricultural research facilities (the State agricultural experiment stations, the 1890 land-grant institutions and Tuskegee, forestry schools, and veterinary schools). For each agency and institutional facility location, the questionnaire requested data on scientist occupancy and effective capacity of existing research facilities (as of September 1977), and committed research facilities, and facility needs at program levels projected for 1981. For facilities needing additional space or renovation of existing space, detailed information was requested on extent and type of need and identity of research programs for which it was needed.

Preparation of a report of the results on the survey is currently underway. This report should be completed and ready for presentation to the Secretary early in 1980.

Budget Committee

The Joint Council presented a report of its budget committee on the President's FY 1980 budget to the Secretary of Agriculture. The report cited the need for additional Federal funding for research, extension,

and higher education recommending that if a supplemental budget request for FY 1980 is possible, USDA and OMB should carefully consider and be guided by the congressional mandates of Title XIV of the Food and Agriculture Act of 1977.

The report further recommended that USDA continue to develop and sharpen its analytical capabilities in the area of priority setting so that necessary program redirections and reallocations of resources can be made to fund new initiatives. For example, it suggests that SEA should initiate as soon as possible a study of the most appropriate mix of "funding types" or mechanism (competitive grants, formula funding, in-house research, extramural research) for research, extension, and higher education.

In commenting on FY 1981 budget development, the report recommended that the Joint Council Executive Committee consider a carefully structured interaction with the Program and Budget Review Board and/or the Deputy Secretary of Agriculture to discuss USDA responsibilities and opportunities in research, extension, and higher education programs.

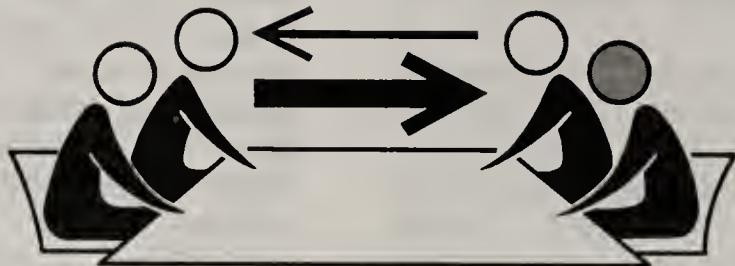
Competitive Research Grants

The Science and Education Administration is authorized under Section 2 of the Act of August 4, 1965, PL 89-106 as amended by Section 1414(b) of PL 95-113, to award competitive grants for research. The Competitive Research Grants Office

administers these competitive grants and is currently funded to support basic research in four areas of plant science and two areas of human nutrition.

The Joint Council received a brief report on how peer review panels for the 1978 competitive research grants program were selected and operated. The Joint Council discussed the

standard operating procedures and policies which are to be used in the administration and awarding of competitive research grants by the USDA. Selected members of the Joint Council reviewed the draft in more detail and made suggestions that were considered in preparing final guidelines for administration and awarding of competitive research grants.



INTERACTION BETWEEN JOINT COUNCIL AND USERS ADVISORY BOARD

Title XIV of the Food and Agriculture Act of 1977 requires that the Joint Council on Food and Agricultural Sciences and the National Agricultural Research and Extension Users Advisory Board hold at least one of their meetings each year as a combined meeting of the two groups. The intent is clearly to further regular exchange of information and views between these representatives of users and providers of research and extension services.

The Joint Council and the Users Advisory Board held their first combined meeting July 10-12, 1979.

The roles and responsibilities of the Joint Council and of the Users Advisory Board were discussed by the respective co-chairmen. This discussion was followed by a working session to

identify critical concerns needing action in the next 24 months and to develop plans for coordinated action by the two groups.

This work session resulted in the following list of concerns which could receive coordinated action during the next 2-year period:

- Redirection of research, extension, and education programs to give emphasis to less energy intensive production, processing and distribution practices which are economic, healthful, and environmentally sound.
- Increase focus of research, extension, and education programs on the use of alternative energy sources in food and fiber production and processing.
- Increased focus of research, extension, and education on the effects of agricultural production, processing, and marketing practices on the nutritional quality, safety, availability, and cost of food.
- Increased efforts to improve public understanding of the need for expanded basic and applied research, extension, and education programs in food and agriculture.

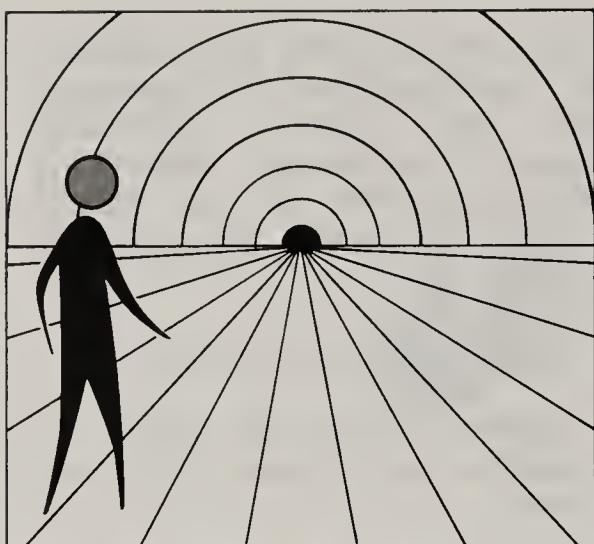
- A comprehensive review and analysis of the structure and organization for agricultural research, extension, and education.
- Expansion of programs to improve social and economic standing of nontraditional clientele, including research to provide more effective extension and education techniques.
- A review of the roles of the Users Advisory Board and the Joint Council in international agricultural research, extension, education, and development.

At the close of the joint meeting, a subcommittee was established and charged with consolidating the issue statements and making recommendations for specific, subsequent action by each group. By September and October the subcommittee reported to both groups. The subcommittee suggested that the Users Advisory Board provide comments by users as to their needs and priorities, and that the Joint Council facilitate coordination

of program planning and conduct. The subcommittee recommended that each body separately prepare statements describing their perception of the nature of the following consolidated issues:

- Energy sources and use.
- Structure of the research, extension, and higher education system.
- The effects of research and extension programs on agricultural production processing, and marketing practices, and, in turn, on the nutritional quality, safety, availability, and cost of food.
- Increasing the public understanding of food and agricultural science and education.

The next combined meeting is scheduled for April 1980 in Washington, D.C. At that meeting, it is expected that the Joint Council will report on its recommendations and actions on the above four issues to the UAB.



OPPORTUNITIES FOR THE FUTURE

Selecting High Priority Areas

The Joint Council is initiating activities to better identify goals and criteria for use in setting priorities for its coordination, evaluation, and planning activities. One objective of this undertaking is to define and explain how to accomplish individual goals and to determine their relative importance to the Council's overall mission. Another objective is to provide guidelines for the large number of persons with a broad base of knowledge about research, extension, and teaching programs who will assign priorities to the individual goals.

Among the overall goals for food and agriculture programs for the 1980-82 period are: (1) improving the well-being of people as consumers of food and fiber products; (2) maintaining and improving the quality of the environment; (3) maintaining and conserving basic natural

resources for future food and fiber production and other uses; (4) maintaining productivity and employment within the food and fiber system; (5) enhancing agriculture's contribution to future growth and stability of the national economy; (6) improving the well-being of people as individuals, families, and rural communities.

Areas of Emphasis for 1980

The Joint Council plans to continue in 1980 its special emphasis on human nutrition, small farms, and integrated pest management. It has also selected four possible new areas of emphasis: (1) energy and agriculture; (2) food and agricultural policies; (3) renewable resources programs and concerns; and (4) food and agricultural regulatory programs.

Five-Year Projections for Programs

The Joint Council, recognizing the need for effective planning to assure continued viability of the science and education system appointed a subcommittee to prepare a 5-year projection called for in Section 1410, Title XIV, PL 95-113.

A preliminary report entitled "Areas of Emphasis in Food and Agricultural Sciences for the Early 1980's," which summarizes the major issues and problems toward which the food and agricultural sciences can be expected to make positive contributions over the next 5

years, was submitted to the Joint Council for consideration. It is meant to provide a sense of direction and to identify broad areas for increasing emphasis for the system of research, extension, and higher education as a whole as it looks toward the future.

Areas cited as needing attention include: (1) productivity and uncertainty; (2) energy; (3) water resources; (4) conservation of natural resources; (5) forest product supplies; (6) marketing and cost reductions; (7) improving social aspects of rural living; (8) improving human nutrition; (9) food concerns; and (10) training and manpower needs. No attempt has been made to assign priorities to these areas. They are cited as areas of concern which are expected to exist in the years ahead.

Budget Development and Support

Through its coordination efforts, the Joint Council is working within USDA and the Federal and State system to lend support to the planning of new budgets. Its aim is to link the planning and coordination process, for which it has major facilitating responsibility, to the Federal and State budget-making processes.

The Joint Council will continue to review the President's budget for agricultural science and education and report on its evaluation. In addition, the Council will monitor the budget-making process and make recommendations for changes that will improve its ability to incorporate the results of planning and priority setting throughout the science and education system.

APPENDICES

JOINT COUNCIL ON FOOD AND AGRICULTURAL SCIENCES
MEMBERSHIP LIST — DECEMBER, 1979

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ACCOMPLISHMENTS OF THE FOOD AND AGRICULTURAL SCIENCE SYSTEM

The basic functions of the U.S. food and agricultural science system are the conduct of research and the effective communication and demonstration of science and technology to farmers, processors, handlers, consumers, students, and other users.

The scope of activities in the food and agricultural sciences includes the social, economic, and political considerations of agriculture, including soil and water conservation and use, the use of organic waste materials to improve soil tilth and plant fertility, plant and animal production and protection, and plant and animal health; the processing, distributing, marketing, and utilization of food and agricultural products; forestry, including range management, production of forest and range products, multiple use of forest and rangelands and urban forestry; aquaculture; home economics, human nutrition, and family life; and rural and community development.

Selected accomplishments of the U.S. system, presented here, will serve to illustrate research achievements and the communication of these research results to users.

- Economic analysis of crop and livestock production, marketing, and natural and human resources

in rural areas makes an important contribution to food science and education. During 1979, this information was made available in numerous reports prepared by ESCS and agricultural economists in land-grant universities.

- The ability to manage natural resources was enhanced by research on the ownership of private U.S. land, including land under foreign control, research on nonpoint source pollutants and on the impacts of alternative water and coal resource development strategies and pest management practices.
- Research on proposed changes in net weight labeling regulations and use of antibacterials and sodium nitrate will help improve nutritional well-being.
- Research findings on revegetation of surface mine spoils show that establishing plants is feasible and practical on low rainfall sites in the southwest. Four native species were established and maintained on mined lands. As an outgrowth of these findings, guidelines have been developed for revegetating spoil materials on the coal fields of central and southern Utah when surface mining begins.
- A custom programmed microchip hand-held calculator has been developed which will permit prediction of not only forest fire behavior, but fire severity in surface fuel. Behavior is predicted from on-site assessment of fuels, weather, and topography. This new technology,

based on many years of fire danger and behavior studies, also enables fire fighters to calculate national fire danger rating indexes before danger occurs.

- Testing and evaluation of Tifton 44 Bermudagrass in 14 States proved it to be equal to Coastal Bermudagrass in disease resistance, yield, and adaptation and superior in winter-hardiness and quality, giving 19 percent better average daily gains when grazed or fed as pellets.

- Discovery of virus as a cause of English Walnut disease will greatly change methods of disease control and will save the walnut industry about \$20 million annually.

- The citrus black fly is no longer a threat to commercial citrus due to the phenomenal success of parasites reared and introduced. A \$5 million per year chemical spray program in Florida has been canceled in favor of the biological control program.

- Successful parasitism of the banded cucumber beetle larvae with a parasitic nematode has been accomplished in the laboratory. This work could open the way for developing a national biological control program of the banded cucumber beetle and the corn rootworm complex. These insects cause millions of dollars in annual losses to such crops as sweet potatoes and corn.

- A farm size methane generator was designed and is successfully

being tested on a 120-sow farrow-to-finish swine farm. Results indicate that sufficient methane can be produced to supply the electrical and heating requirements of the swine buildings by using the manure from these buildings.

- Researchers in Puerto Rico have used their research and that of other States to help develop a comprehensive plan to modernize agriculture in Puerto Rico. The technology developed by these scientists is potentially transferable to vast regions of the humid tropics.

- Researchers developed a fumigation procedure using phosphine gas on baled hay in large shipping containers. This enabled resumption of hay exports to Japan. The value of the hay export during the initial 60 day period exceeded by many times the cost of research to develop the fumigation treatment.

- Novel techniques and equipment for producing no-twist cotton yarn, under development by scientists, show promise for significant reductions in cost of making yarns.

- Researchers have succeeded in preventing aflatoxin formation in corn during the storage drying process by trickling ammonia through the corn.

- A way to drastically reduce the energy needed to distill anhydrous ethanol from grains or biomass has been discovered. This new method gives 10 times as much energy in the ethanol distilled as is used in the distillation process.

- Wood product industries can almost totally eliminate fossil-fuel use, through a process that involves using and reusing the incoming wood materials.
- Super strains of nitrogen-fixing bacteria have been discovered that produce twice as much nitrogen in soybeans as do native strains normally found in the soil.
- Scientists have discovered a way of identifying chickens with high genetic resistance to Marek's disease. The method involves injecting chickens with an artificially prepared antigen. This advance gives breeders another tool to use in defeating this troublesome disease.
- Special Extension programs for small and limited resource farm families provided aid to 4,550 farmers in 14 southern States in 1979. Seventy-five percent of the participants showed increased sales.
- All 50 States, Puerto Rico, and the Virgin Islands now have Integrated Pest Management (IPM) programs which, in total, cover 45 commodities. Several State extension services have started or are planning urban and 4-H IPM projects. Some 768,370 acres of cotton in 11 States are covered by extension IPM programs and another 1.5 million acres are under private consultant programs.
- In 1979, the State cooperative extension services provided training for about 292,000 commercial pesticide applicators. Over 2 million private applicators have already received initial training.
- Extension services operated urban gardening programs in 16 major cities in 1979. Benefits widely publicized through local and national news media included savings on food bills, community renewal and beautification, restored self and civic pride, and reductions of juvenile delinquency. As one program coordinator put it, "We didn't just grow vegetables, we grew hope."
- Extension's Community Resource Development programs help improve rural income and employment, improve the access of rural residents to essential community services and facilities, and strengthen a community's abilities to define and solve its problems. In 1979, a 20-State study showed more than 6,000 Extension assisted business and industrial projects underway or completed.
- Extension's home energy audits are paying off. As a result of the audits in one State alone, homeowners spent \$831,000 on energy-conserving home improvements. These improvements are now saving about \$327,000 worth of fuel per year at current fuel prices.
- Nearly 4,000 home economists, assisted by some 600,000 volunteers, conducted home economics Extension programs in nearly every State to help families identify their needs, make improved decisions, and use and conserve their resources to achieve a desired level of living. In 1979, Extension educators helped nearly 30

million families deal with inflation, energy, nutrition, and family-related problems.

- In September 1979, the first in a new series of nutrition booklets designed to help the public choose healthful diets was issued. The full-color booklet entitled "Food," includes a new version of the daily food guide, suggests ways of cutting calories, and discusses fats, sodium, fiber, sugar, and iron.

- Cropland under minimum tillage, conservation tillage, and other reduced tillage methods was 47.7 million acres in 1977. This increased by 4 million acres in 1978. Extension's educational programs have encouraged farmers to reduce erosion and have saved energy through these minimum tillage practices.

- Extension's Beef Commodity Industry Program, initiated in 1976, has resulted in the establishment of the Beef Improvement Federation involving 45 industry organizations and the resultant format for the Beef Improvement Federation Performance Testing Program.

- Extension is continuing its educational efforts in transportation. Approaches are being designed to assist agricultural and rural groups as well as

transportation firms to understand the need for transportation plans and to help assure that adequate consideration is given agricultural and rural interest in the development of State transportation plans. Currently, demonstration projects that will further these efforts are being developed in two States. Upon completion of these projects, the methodology will be made available to all State Cooperative Extension Services.

- An extensive migrant education program is being developed in one State, reaching more than 6,000 migrant youth in the 4-H program. A gardening program at a migrant labor camp has attracted 300 youth participants and nutrition education was taught to over 3,000 youth at day camps for migrant youth during 1979.

- A 4-H youth agent in a southern State has developed a plan with Farmers Home Administration to help youth borrow money to purchase high quality breeding animals. About one-third of the youth enrolled in the project took advantage of the loan program. Seventy-three youths borrowed a total of \$140,000 to purchase breeding cattle. Each borrowing 4-H member is responsible for repayment of the loan. This loan program has been very helpful to families with limited income.

